

## Icona Solutions

Innovation is an increasingly critical source of competitive advantage in manufacturing industry. Improving communication between designers and engineers, anticipating problems in manufacturing assembly and accurately visualising what the customer will actually see when first viewing a product – these are all key to delivering new product developments that help companies to build and maintain their competitive edge.

Icona Solutions helps manufacturers to address these issues and create faster, more effective and more desirable innovations. Our solutions for auditing and improving Perceived Quality enable companies to evaluate their product's ability to fulfil customers' expectations at a far earlier stage in the product development process than has previously been possible.

Our aesthetica software uniquely combines key elements of variation analysis and high-end visualisation technologies to provide immediate and accurate insight into the impact of manufacturing variation on Perceived Quality – not only helping to improve the finished product, but also saving time, reducing costs and improving communication and collaboration in the process.

## Summary of business benefits

### Collaboration

- Provides common visual language, enabling designers and engineers to communicate more effectively
- Increases confidence by enabling manufacturing to be involved in the feasibility assessment at an earlier stage

### Variation and visualisation

- Accurately shows fit and finish problems in manufacturing assembly
- Shows exactly what the customer will see when they first view the product

### Process and cost efficiency

- Shifts emphasis away from time-consuming physical prototyping
- Increases use of digital modeling and production processes throughout the product design-to-manufacturing lifecycle
- Avoids late discovery of costly issues in production
- Identifies and resolves critical engineering issues when cost of change is low
- Leads to fewer iterations of the model and increased manufacturing yields



## Unique features

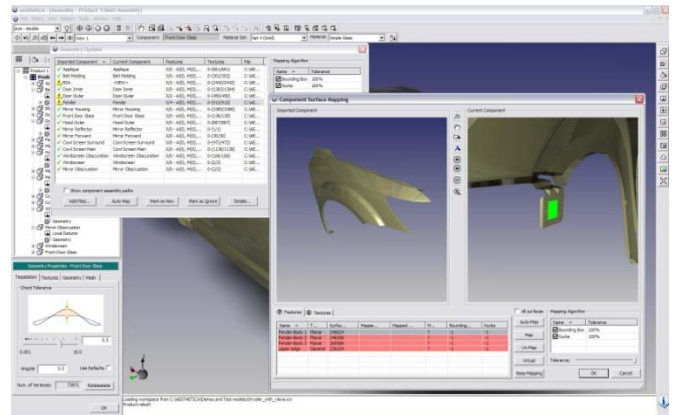
- Predict variation and physical deformation and apply this directly to the shape and position of components within an assembly
- Photo-realistic visual simulation of the variation and how it will affect the final fit and finish of the product
- Assess Perceived Quality from the customers perspective in real environments very early in the product development
- Directly compare measurement targets with predicted variation based on existing manufacturing processes and experience
- Analyze assemblies containing rigid and flexible components

## Data preparation features

- Import CAD geometry in either STEP, IGES, JT and ICN format
- Full range of tools for editing geometry, materials, features, GD&T and measurements to quickly construct full simulation models
- Sophisticated update function to quickly and automatically refresh simulation models with the latest CAD data



- Powerful tools to merge, splitting and group components to create an optimal assembly structure for visualisation and simulations
- Interactive product tree browsing for rapid navigation of assembly structure and quick access to component properties
- User programmable viewing positions with an intuitive 3D camera model for defining preset audit viewing positions
- Define multiple material sets representing each color and trim variant for the product and then quickly switch between them
- Interactive 3D viewing windows supporting direct constraint-based manipulation of the assemblies and components
- Task bar to track progress and guide you efficiently through the preparation process
- Familiar Windows® based interface support customer toolbars, drag and drop and dock-able UI elements
- Precise B-Rep geometry is maintained for all components and used for simulation operations
- User defined tessellation of CAD geometry gives you full control over the trade-off between rendering speed and visualize quality



## Visualization features

- High performance interactive 3D rendering of large complete CAD models
- Utilizing the latest graphics hardware to deliver very high quality visualisation, include per-pixel shading and user defined anti-aliasing
- Full support for environment mapping and 360x360 cubing mapping with customizable environments
- Large library of fully configurable shader materials including advanced materials such as chromactive paint, technical grains, textile finishes
- 100% Compatible with Open GL v1.2 hardware and software drivers and above
- Configurable drop shadows and dynamic inter-object shadowing calculated interactively
- User defined lighting environments supporting multiple simultaneous light sources, including directional, point and spot lights
- Full support for active and passive 3D stereoscopic rendering with programmable offsets
- Net meeting compatibility mode allows visualisation to be shared using popular conferencing and application sharing systems



## Simulation features

### Feature recognition and creation

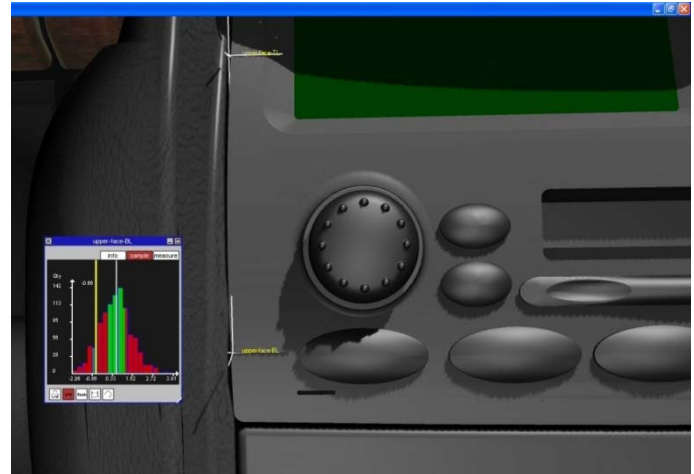
- Automatic identification of geometric features including planar, cylindrical, circular and slots/tabs
- Direct creation of virtual feature set from B-Rep geometry, including fast alignment and positions tools

### Interactive constraint-based assembly modeling

- Incrementally define mating conditions between features and test the kinematic behavior by directly interacting with the components
- Constraints include rigid, concentric, against, planar and axis alignments, pin/hole and pin/slot
- Full support for construction and simulation of over-constrained assemblies
- User defined assembly sequence with drop and drop re-assignment
- Constraint satisfaction takes full account of component flexibility
- Disable and enable constraints interactively and reset to nominal

### Tolerance Specification

- Full support for the ASME Y14.5 standard, including all location, form and profile tolerance types
- Set tolerances relative to a primary, secondary or tertiary datum schemes
- Define tolerance distributions as normal, uniform or trapezoidal
- Apply geometry variation to form and profile tolerances to represent different manufacturing effects at a geometric level
- Full Monte Carlo analysis of tolerance model



## Simulation of component deformation

- Automatic generation of mesh for all components marked as flexible
- Mesh resolution and complexity can be configured to manage the speed versus accuracy trade off
- User definable physical properties including plate thickness, tensile strength, Young's Modulus, and node/edge resolution
- Non-linear deformation solver optimized to deliver interactive performance
- Special analysis shader provided to interactively visualize the deflection/stress contours during visual analysis of results

## Gap and flush measurements

- Interactively define 2D measurement sections on the 3D model
- Snap sections of surfaces, edge curves and coordinate axis
- Individual gap and flush measurement can be defined within the 2D section and snapped to section lines
- Gap and flush points automatically track the movement of the components and measured during Monte Carlo analysis

## Review

- Full screen 3D review window hides the windows interface and allows you to focus on the direct interaction with the product and simulation results
- Present the visual result of predicted or specified variation on the product assembly
- Display 2D sections, variation histograms and numerical results for measurement points
- Interactively browse the variation histogram to visualize the Monte Carlo results
- Dynamic tape measures allow live measurements to be taken directly off the digital model
- Switch between multiple material sets and view the chosen sample with different finishes or trim options
- Use the gap and flush fit tool to visualise any combination of gap and flush conditions specified by design



## Data input / output

- Automatically create reports using the fully customizable report generator
- Template reports provided for typical measurement and tolerance reports
- Output complete 3D model, including variation to HyperShot from BunkSpeed to produce photo-realistic snapshots
- Generate animations and movies in AVI format of model fly throughs and max/min variations
- Export component geometry in STEP and IGES format

## System Requirements

### Operating System

Windows® XP Professional with Service Pack 2 or better

### Hardware Configurations

2.8 GHz Intel or equivalent AMD CPU (dual or quad core optional)

4 GB RAM

NVIDIA GeForce 8800 GTS or Quadro FX series graphics card with 512MB graphics memory

7,200 RPM Hard drive with 50GB free

### Laptops

Use of laptops should be limited to small to medium size models

2.8 GHz Intel or equivalent AMD CPU (dual or quad core optional)

4GB RAM

NVIDIA Quadro FX 2500M (512MB Graphics memory) or better

7,200 RPM Hard drive with 50GB free



## Official aesthetica reseller

